## (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

## (19) World Intellectual Property Organization International Bureau



# 

### (43) International Publication Date 28 April 2005 (28.04.2005)

#### PCT

## (10) International Publication Number WO 2005/038244 A1

(51) International Patent Classification7:

F03B 13/14

(21) International Application Number:

PCT/GB2004/004393

- (22) International Filing Date: 15 October 2004 (15.10.2004)
- (25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 0324183.3

16 October 2003 (16.10.2003)

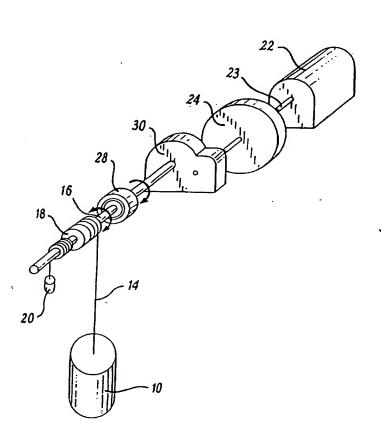
- (71) Applicant (for all designated States except US): THE UNIVERSITY OF MANCHESTER [GB/GB]; Oxford Road, Manchester M13 9PL (GB).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): STANSBY, Peter, Kenneth [GB/GB]; Heawood Hall Farmhouse, Nether Alderly, Macclesfield, Cheshire Sk10 4TN (GB).

WILLIAMSON, Alan, Charles [GB/GB]; 128 Park Road, Timperley, Manchester WA15 6TQ (GB).

- (74) Agent: HITCHCOCK, Esmond, Antony; Lloyd Wise, Commonwealth House, 1-19 New Oxford Street, London WC1A ILW (GB).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,  $\mathsf{MG}, \mathsf{MK}, \mathsf{MN}, \mathsf{MW}, \mathsf{MX}, \mathsf{MZ}, \mathsf{NA}, \mathsf{NI}, \mathsf{NO}, \mathsf{NZ}, \mathsf{OM}, \mathsf{PG},$ PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR UTILISING WAVE ENERGY



(57) Abstract: Apparatus for extracting energy from waves comprises a float device coupled to a shaft such that vertical movement of the float devices drives the shaft. Movement of the float device is generated by the wave motion, and the mass of the float device is such that its natural frequency of vertical oscillation is substantially resonant with the frequency of a sea wave. The mass of the float device can be adjustable to achieve this.

WO 2005/038244 A1

GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

#### Declaration under Rule 4.17:

— as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY,

TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA; GN, GQ, GW, ML, MR, NE, SN, TD, TG)

#### Published:

with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.